

Project Request

Project #26271 : Genetic Ancestry and IQ: Discrimination, Family Environment, or Genetics?



Project name Genetic Ancestry and IQ: Discrimination, Family Environment, or Genetics?
Project ID 26271
Approved user name Bryan Pesta
Institute affiliation CLEVELAND STATE UNIVERSITY (Non-Profit)
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Approved Research Use Statement

RUS:

Title: Genetic Ancestry and IQ: Discrimination, Family Environment, or Genetics?

Funding body: None

Keywords provided by the Applicant PI to describe the research project:

PGS, intelligence, admixture, sibling

Application Lay Summary:

"Genetic Ancestry and IQ: Discrimination, Family Environment, or Genetics?"

Recently, Lee et al. (2018) report low transethnic validity for their educational PGS. They conclude that, because of this low validity with respect to years of education, scores will be most useful for European descent individuals. However, Lee et al. (2018) did not rigorously evaluate transethnic validity and Lee et al.'s discussion (2018) elides important caveats, namely: the method of score construction and the criterion trait used. PGS created in a way that increases the ratio of tagged to causal variants will decrease transethnic validity. And a reduced trait heritability in one population will also decrease PGS validity. In line with the noted concern, Lasker, Pesta, Fuerst, and Kirkegaard (2019), examined the relation between PGS and g among African and European Americans. It was found that the European-based Multi-trait analysis of GWAS (MTAG) PGS had 50% validity among African Americans. We would like to determine if the results of Lasker et al. (2019) hold in context to the Add Health. Further, Lasker, Pesta, Fuerst, and Kirkegaard (2019) found that 50 to 70% of the phenotypic gap between African and European Americans could be accounted for by genetic ancestry. They found that the effect of genetic ancestry was independent of self-identified race and phenotypic indexes of race. Moreover, they found that this effect was partially mediated by intelligence/education related PGS. We would like to attempt to replicate these analyses using the Add Health survey. Additionally, Hu, Lasker, Fuerst, and Kirkegaard (2019) found, based on the NLSY97, that while, in the African American population, there was a relation between color and IQ, this relation did not exist between full siblings, consistent with a vertical transmission model. This finding provides evidence against a simple discriminatory model and is thus of interest. We would like to see if these results hold in context to the Add Health survey, which has a large sibling sample.

Secure use, storage, and handling of the Add Health Data Files outlined in the Security Plan

To meet the Add Health Secure use, storage, and handling requirement, we plan to follow the steps outlines in the following link:

<https://www.cpc.unc.edu/projects/addhealth/contracts/security/externaldrive>

Specifically, we plan to store the data on a desktop model hard drive. This will be kept in a locked cabinet at Bryan J. Pesta, the investigator's, home office. All analyses will be conducted on a desktop in the investigators home, following the protocols outlines in the link above.

References

Hu, M., Lasker, J., Kirkegaard, E. O., & Fuerst, J. G. (2019). Filling in the Gaps: The Association between Intelligence and Both Color and Parent-Reported Ancestry in the National Longitudinal Survey of Youth 1997. *Psych*, 1(1), 240-261.

Lee, J. J., Wedow, R., Okbay, A., Kong, E., Maghzian, O., Zacher, M., ... & Fontana, M. A. (2018). Gene discovery and polygenic prediction from a genome-wide association study of educational attainment in 1.1 million individuals. *Nature genetics*, 1.

Non-Technical Summary

Non-technical summary

Lasker, Pesta, Fuerst, and Kirkegaard (2019) recently found that, among African-European Americans, European ancestry predicts cognitive ability independent of race-associated phenotype and self-identified race/ethnicity. Further, the authors show that the relation was partially mediated by IQ/Education-related PGS. The sample analyzed was the Philadelphia Neurodevelopmental cohort. The authors argue that it would be worthwhile to attempt replication using a national sample with a phenotypic index of color. We would like to do this using The National Longitudinal Study of Adolescent to Adult Health (Add Health) survey and associated dbGaP files. In addition to the analyses conducted by Lasker, Pesta, Fuerst, and Kirkegaard (2019) and in line with those conducted by Hu, Lasker, Fuerst, and Kirkegaard (2019), we plan on including a sibling analysis. The idea is to see if the relation between color and cognitive outcomes exists between siblings. The rationale for this analysis is given by Hu et al. (2019).

Collaborators

Internal

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